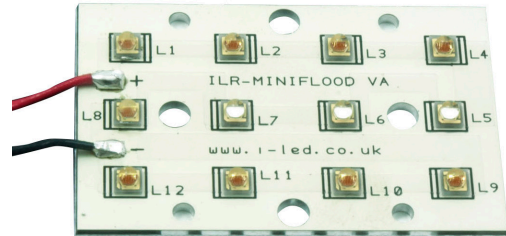


Horticultural Recipe 12 LED Petunia Boards

IHR-OX12-xxxx-SC221-W2.

Product Overview

IHS has a range of LED Light Engines designed for the key stages of plant development from germination/seeding to flowering and fruiting. Working closely with OSRAM Opto Semiconductors IHS has identified 8 key LED recipes and produced a range of bespoke light engines. There are recipes for Seeding, Biomass, Fruiting and Flowering, there are also versions which target users who do not have access to sunlight, and these specific recipes have white LEDs to compensate for the lack of sunlight, for example in a plant factory. This datasheet contains recipes based on our Petunia light engine, the Petunia is a 46.5mm x 30mm PCB featuring 12 OSLOM SSL LEDs from OSRAM Opto Semiconductors, the Petunia light engine has been designed around the Petunia Lens from LEDiL.



Applications

- Horticultural Lighting
- Compact designs
- Miniture green houses

Technical Features

- Petunias contain OSLOM[®] LEDs from OSRAM Opto Semiconductors, with integral 150 degree silicone resin Lens
- Up to 100,000 Hour lifetime to 70% of original brightness
- Mounting holes using M3 screws allows easy installation
- Size (L x W x H): 46.5mm x 30mm x 4mm
- Secondary Lens can be fitted – check options in suitable Lens and Reflector section
- Suitable Heatsinks available – check options in Heatsink section
- Suitable Power Supplies available - check options in Power Supplies section
- Suitable Thermal Interface Material available - check options in Thermal Interface Material section
- Supplied with 200mm wires as standard
- Petunias can be linked together to produce longer chains

*This datasheet should be read in conjunction with the relevant OSRAM Opto Semiconductors data on the LED used


Important Information and Precautions


- The LEDs, when powered up, are very bright. Thus it is advised that you do not look directly at it. Turn the Petunia away from you and do not shine into the eyes of others.
- Petunias will overheat in operation if not attached to a suitable Heatsink. Overheating can cause failure or irreparable damage.
- Do not operate Petunia with a Power Supply with unlimited current. Connection to constant voltage Power Supplies that are not current limited may cause the Petunia to consume current above the specified maximum and cause failure or irreparable damage
- Petunias, when operated, can reach high temperatures thus there is risk of injury if they are touched.
- DO NOT HOT PLUG ON LED SIDE OF POWER SUPPLY
- DO NOT TOUCH or PUSH on the LED as this can cause irreparable damage.

Standard Product Options

Our Petunia range of products are targeting 4 areas of horticulture: Biomass, Seeding, Flowering and Fruiting.

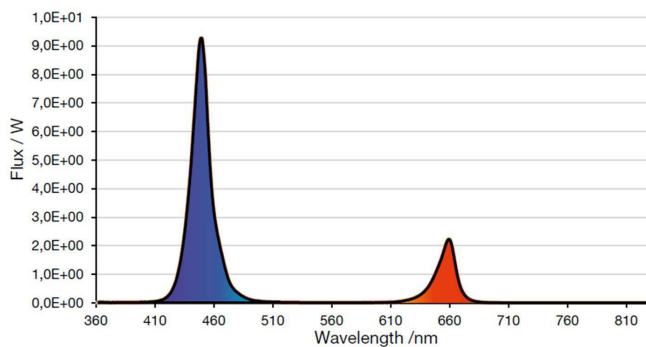
Each of these areas has a version based on whether the application is for an environment with existing daylight, or an environment with no or limited daylight.

 Products with this symbol have been designed to supplement already available daylight. We are assuming the end application gets enough good quality daylight and these products offer increases in critical wavelengths.

 Products with this symbol have been designed to replicate crucial wavelengths for their end application. We are assuming the end application has no daylight, and these products offer the only source of useable wavelengths.

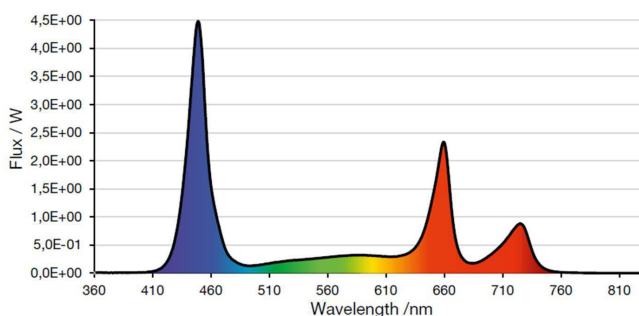
Seeding with existing daylight

IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-9DB3HR-SC221-W2.	9 Deep Blue 455nm	9.21W	23.84	39.65	31.95V	GDCSHPM1.14
	3 Hyper Red 656nm		15.82			GHCSHPM1.23



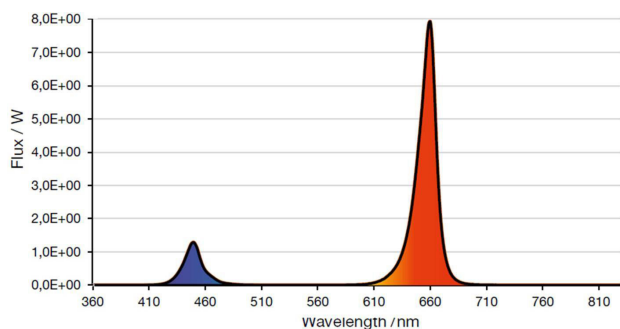
Seeding without existing daylight

IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-2F3H3N-W4D-SC221-W2.	4 Deep Blue 455nm	7.57W	10.59	32.07	30.15V	GDCSHPM1.14
	3 Neutral White 4000K		5.02			GWCSHPM1.EM
	3 Hyper Red 656nm		15.82			GHCSHPM1.23
	2 Far Red 730nm		0.64			GFCSHPM1.13



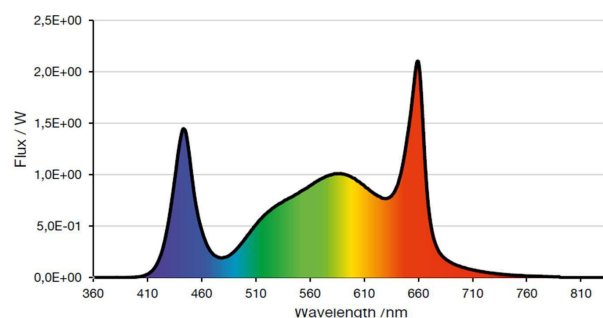
Biomass with existing daylight

IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-3HR-1FR8DB-SC221-W2.	3 Hyper Red 656nm	10.79W	7.95	55.4	26.1V	GDCSHPM1.14
	1 Far Red 730nm		0.32			GFCSHPM1.13
	8 Deep Blue 455nm		47.45			GHCSHPM1.23



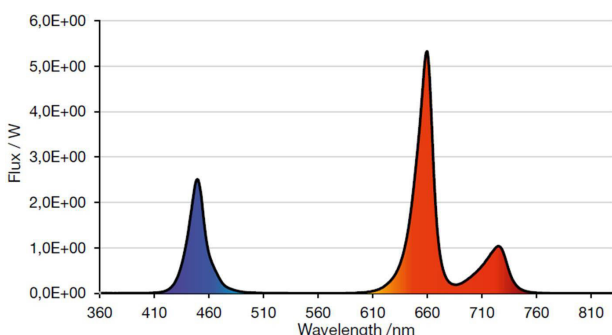
Biomass without existing daylight

IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-9NW3HR-SC221-W2.	9 Neutral White 4000K	5.6W	16.73	27.27	32.7V	GWCSHPM1.EM
	3 Hyper Red 656nm		10.54			GHCSHPM1.23



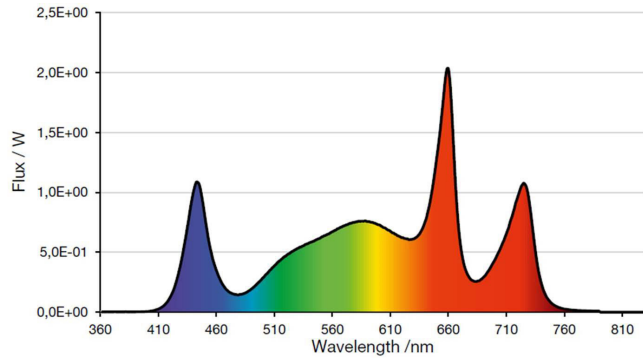
Flowering with existing daylight

IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-6HR3DB3FR-SC221-W2.	6 Hyper Red 656nm	9.05W	31.63	40.53	27V	GHCSHPM1.23
	3 Deep Blue 455nm		7.95			GDCSHPM1.14
	3 Far Red 730nm		0.95			GFCSHPM1.13



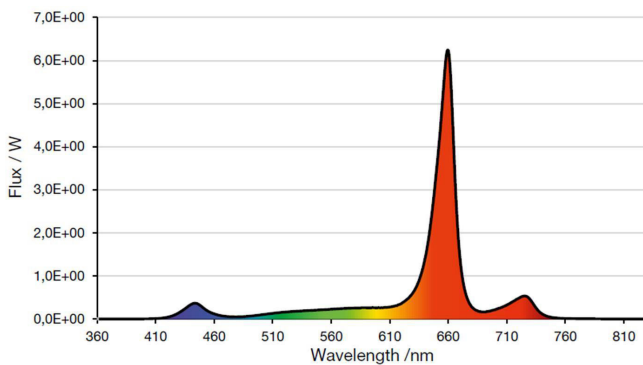
Flowering without existing daylight

IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-6NW3HR-3FR-SC221-W2.	6 Neutral White 4000K	6.24W	10.04	29.25	27V	GWCSHPM1.EM
	3 Hyper Red 656nm		15.82			GHCSHPM1.23
	3 Far Red 730nm		0.95			GFCSHPM1.23



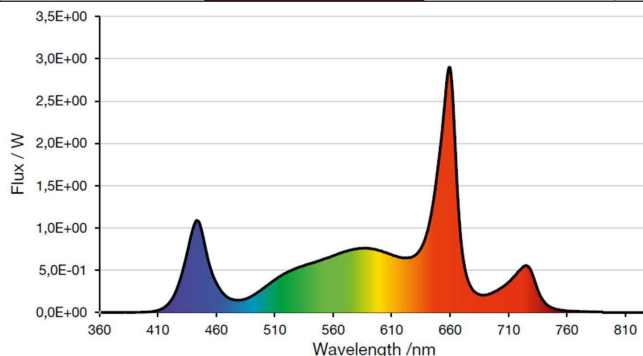
Fruiting with existing daylight

IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-1FR9HR2NW-SC221-W2.	1 Far Red 730nm	9.8W	0.32	51.12	26.55V	GFCSHPM1.23
	9 Hyper Red 656nm		47.45			GHCSHPM1.23
	2 Neutral White 4000K		3.35			GWCSHPM1.EM



Fruiting without existing daylight

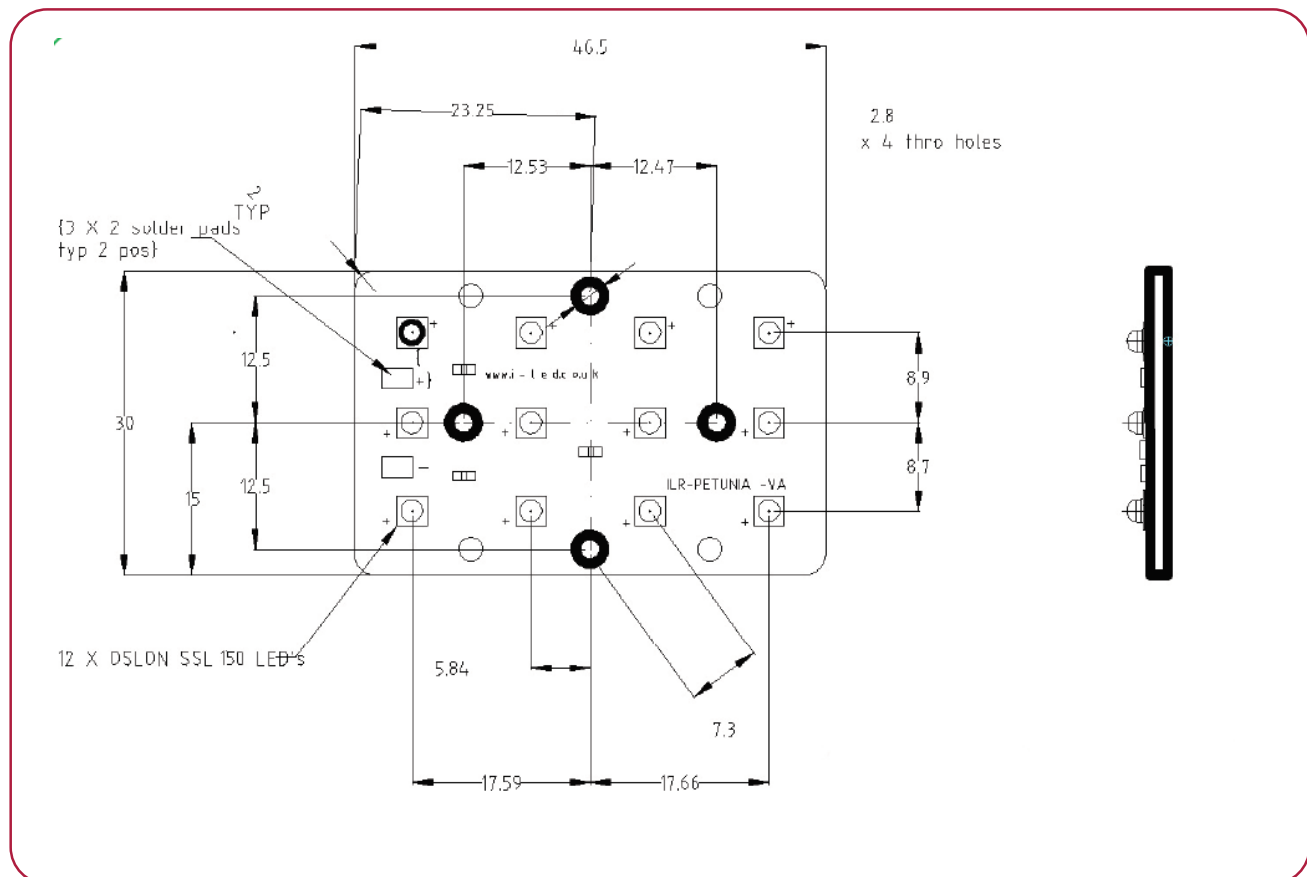
IHS Part Number	LED Recipe	Total Optical Power (W)	Individual Photal Flux (umol)	Combined Photal Flux (umol)	Forward Voltage	Relevant OSRAM LED Data
IHR-OX12-6NW4HR-2FR-SC221-W2.	6 Neutral White 4000K	6.83W	10.04	31.77	29.4V	GWCSHPM1.EM
	4 Hyper Red 656nm		21.09			GHCSHPM1.23
	2 Far Red 730nm		0.64			GFCSHPM1.23



Minimum and Maximum Ratings

IHS Part Number	Operating Temperature at Tc-Point [°C]*	Storage Temperature [°C]*	Forward Current per chip [mA]*	Reverse Voltage [Vdc]*
IHR-OX12-9DB3HR-SC221-W2.	70°C max	40 to 110°C	1,300mA max	not designed for reverse voltage
IHR-OX12-2F3H3N-W4D-SC221-W2.		40 to 110°C	1,300mA max	not designed for reverse voltage
IHR-OX12-3HR-1FR8DB-SC221-W2.	70°C max	40 to 110°C	1,300mA max	not designed for reverse voltage
IHR-OX12-9NW3HR-SC221-W2.	70°C max	40 to 110°C	1,300mA max	not designed for reverse voltage
IHR-OX12-6HR3DB-3FRSC221-W2.	70°C max	40 to 110°C	1,300mA max	not designed for reverse voltage
IHR-OX12-6NW3HR-3FR-SC221-W2.	70°C max	40 to 110°C	1,300mA max	not designed for reverse voltage
IHR-OX12-1FR9HR2NW-SC221-W2.	70°C max	40 to 110°C	1,300mA max	not designed for reverse voltage
IHR-OX12-6NW4HR-2FR-SC221-W2.	70°C max	40 to 110°C	1,300mA max	not designed for reverse voltage

Technical Drawing (mm)



3D drawing files are available on request from IHS. Please call or email

Lens and Reflector Options

LEDiL precision-engineered Lenses and Reflectors allow for rapid deployment of all types of light fixtures, including street lights, wall-wash, high-bay, sconces, emergency beacons, parking garage/low-bay, MR and AR down lights, and dock lights. Precision-engineered for maximum efficiency and durability, LEDiL Lenses and Reflectors are released alongside the latest product releases from our LED suppliers. You select the best LED for the application; choose LEDiL and you're selecting the best optical solution as well.



Ordering Code	Beam	Diameter	Height	Family	FWHM	Material	Colour	Fastening
C12528_PETUNIA	M	29.5 x 46.5mm	7.4mm	Petunia	+/- 30	PMMA	Clear	Pin
C16520_PETUNIA2	S	29.5 x 46.5mm	7.4mm	Petunia	+/- 25	PMMA	Clear	Pin

Heatsink Options

IHS has a series of Aluminium Alloy Heatsinks to be used with our standard range of Petunia. These Heatsinks are supplied with fixing screws for the light engine and for fixing to a base plate. They also come with Thermal Interface Material (TIM) attached to the top surface. More versions will be introduced over the coming months and we are also happy to manufacture custom Heatsinks to your request.

	Operates under the recommended ILS junction temperature
	Operates under the recommended LED maximum junction temperature
	Not suitable for use
N/A	Heatsink not designed for use with this product

IHS Product		no Heatsink in free air	ILA-HSINK-STAR-50X20MM	ILA-HSINK-STAR-50X40MM	ILA-HSINK-STAR-50X60MM	ILA-HSINK-STAR-50X80MM	ILA-HSINK-70X70X55MM	ILA-HSINK-78X46X25MM
OSLON 12 LED Petunia	350mA		N/A	N/A	N/A	N/A		
	700mA		N/A	N/A	N/A	N/A		
	1000mA		N/A	N/A	N/A	N/A		



Drivers

IHS has a comprehensive range of standard Power Supplies. The table below shows forward voltage of each LED driver please consult the product options table to find the forward voltage of the Petunia used.








Additional Power Supplies are being introduced so please call us or check our website for the latest offering.

To determine how many Petunias can be used with each LED driver you will need the following. Forward voltage of the Florence and forward voltage of the LED Driver.

For example IHR-OX12-6NW3HR3FR-SC221-W2. forward voltage of 27V (this can be found under product options page 2) and IZC045-040A-9266C-SA has an output voltage of 30 - 89V.

To determine the minimum number of Petunias this driver can run take the minimum output voltage of the Driver 6.00V and divide by the forward minimum voltage of the Petunia $27.00 - 30.00 \div 27.00 = 1.11$ Petunias.

To determine the maximum number of Petunias this driver can run take the maximum forward voltage 48.00V and divide this by the maximum forward voltage of the Petunia $27.00V - 89.00 \div 27.00 = 3.30$ Petunias.

IHS Driver Part Number	Rating	Current	Forward Voltage	Image
IZC035-017F-0067A-SA	17	350mA	6 - 48V	
IZC035-018T-9500A-SX	18	350mA	15 - 52V	
IZC070-035F-0067C-SA	35	700mA	9 - 48V	
IZC045-040A-9266C-SA	40	450mA dim	30 - 89V	
IZC050-060F-9067C-QA	60	500mA	50 - 110V	
IZC070-050A-9267C-SA	50	700mA	24 - 72V	
IZC070-075A-9267C-SA	75	700mA dim	54 - 108V	

Thermal Interface Material Options

IHS have produced a range of high-performance, cost effective Thermal Interface Materials to match perfectly their standard products. Our product fills the air pockets between the two surfaces, forming a continuous layer to conduct heat away from the LED to the Heatsink.

Product	Non Adhesive	Single Sided Adhesive	Double Sided Adhesive
Petunia Grow Light	ILA-TIM-PETUNIA-0A	ILA-TIM-PETUNIA-1A	ILA-TIM-PETUNIA-2A

Other sizes are available, including customised parts.

Assembly Information

- The mounting of the Petunia has to be on a metal Heatsink.
- In order to optimise the thermal management, the metal surface needs to be clean (dirt and oil free) and planar for the best contact with the LED module. A thermal grease or heat transfer material is highly recommended.

Safety Information

- The LED module itself and all its components must not be mechanically stressed.
- Assembly must not damage or destroy conducting paths on the circuit board.
- The mounting of the module is carried out by attaching it at the mounting holes. Metal mounting screws must be insulated with synthetic washers to prevent circuit board damage and possible short circuiting.
- To avoid mechanical damage to the connecting cables, the boards should be attached securely to the intended substrate. Heavy vibration should be avoided.
- Observe correct polarity!
- Depending on the product, incorrect polarity will lead to emission of red or no light. The module can be destroyed!
- Pay attention to standard ESD precautions when installing the Petunia.
- The Petunia, as manufactured, have no conformal coating and therefore offer no inherent protection against corrosion.
- Damage by corrosion will not be accepted as a materials defect claim. It is the user's responsibility to provide suitable protection against corrosive agents such as moisture and condensation and other harmful elements.
- For outdoor usage, a housing is definitely required to protect the board against environmental influences. The design of the housing must correspond to the IP standards in the application. It is also the responsibility of the user to ensure any housings or modifications keep the Tc junction temperature to within stated ranges.
- To also ease the luminaire/installation approval, electronic control gear for LED or LED modules should carry the CE mark and be ENEC certified. In Europe the declarations of conformity must include the following standards: CE: EC 61374-2-13, EN 55015, IEC 61547 and IEC 61000-3-2 - ENEC: 61374-2-13 and IEC/EN 62384.
- The evaluation of eye safety occurs according to the standard IEC 62471:2006 ("photobiological safety of lamps and lamp systems"). Within the risk grouping system of this CIE standard, the LED specified in this data sheet falls into the class "moderate risk" (exposure time 0.25s). Under real circumstances (for exposure time, eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. As is also true when viewing other bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment and even accidents, depending on the situation.

For further information please contact IHS

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Intelligent Horticultural Solutions is a division of Intelligent Group Solutions, focusing on providing LED solutions to the rapidly evolving and highly important horticultural lighting market.

All trademarks recognised.